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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/052,234	01/16/2002	Duc Chau	40013.003	9589
27966	7590	09/23/2004	EXAMINER	
KENNETH E. HORTON KIRTON & MCCONKLE 60 EAST SOUTH TEMPLE SUITE 1800 SALT LAKE CITY, UT 84111			GARCIA, JOANNIE A	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 09/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/052,234

Applicant(s)

CHAU ET AL.

Examiner

Joannie A Garcia

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 18-20 and 25-31 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3,4,7-11,22 and 23 is/are allowed.
- 6) ☒ Claim(s) 1,2,5,6,12,13,16,17,21 and 24 is/are rejected.
- 7) ☒ Claim(s) 14 and 15 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

Claims 12-17, and 24, are objected to because of the following informalities:

Claims 12 and 24, recite the limitation "portion of the substrate not containing the nitride-containing layer" in lines 4-5, and 5-6, respectively. There is insufficient antecedent basis for this limitation in the claim.

Claim 13 recites the limitation "distance" in line 1. There is insufficient antecedent basis for this limitation in the claim.

Appropriate correction is required.

In claim 14, line 1, "polysilicon" should be preceded by --doped--.

Claim 15 recites the limitation "polysilicon layer" in line 2. There is insufficient antecedent basis for this limitation in the claim.

Claim 16 recites the limitation "polysilicon layer" in lines 2-3. There is insufficient antecedent basis for this limitation in the claim.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 2, 5, 6, 12, 16, 17, 21, and 24, are rejected under 35 U.S.C. 102(e) as being anticipated by Yamada et al (U.S. Patent 6,770,535).

Yamada et al discloses providing a semiconductor substrate 1 with an upper surface (Figure 1), providing a nitride-containing layer 5 on a portion of the substrate upper surface

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(Figure 3), providing a trench 7a/7b in the substrate in a portion of the substrate not containing the nitride-containing layer thereon (Figures 4-5), providing a gate oxide layer 8a on a bottom and sidewall of the trench (Figure 9), providing a conductive layer 9a on a bottom and sidewall of the gate oxide layer (Figure 12), the conductive layer having an upper surface below the upper surface of the substrate (Figure 14), providing a self-aligned isolation cap 10/12a within the trench by selectively depositing a non-organic dielectric material, such as silicon oxide, on the upper surface of the conductive layer (Figures 19, and 21, and Column 17, lines 7-15), and by depositing a combination of dielectric materials with different etching rates such as silicon nitride and silicon oxide (Figures 15, 16, 19, and 21, Column 15, lines 57-63, and Column 17, lines 7-15), and removing the nitride-containing layer (Figures 19 and 21).

Yamada et al discloses providing a semiconductor substrate 1 with an upper surface (Figure 36), providing source and channel regions 15a in the substrate (Figure 38), providing a nitride-containing layer 5 on a portion of the substrate upper surface (Figure 36), providing a trench 7 in the substrate in a portion of the substrate not containing the nitride-containing layer thereon (Figures 36), providing a gate oxide layer 8a on a bottom and sidewall of the trench (Figure 37), providing a conductive layer 9a on a bottom and sidewall of the gate oxide layer, wherein the conductive layer comprises metal (Figure 37, and Column 23, lines 62-65), the conductive layer having an upper surface below the upper surface of the substrate (Figure 38), providing a self-aligned isolation cap 41/42a within the trench comprising a non-organic dielectric material, such as silicon oxide (Figure 42, and Column 24, lines 12-37), and removing the nitride-containing layer (Figure 38).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamada et al as applied to claims 1, 2, 5, 6, 12, 16, 17, 21, and 24 above, and further in view of the following comments.

With respect to claim 13, it would have been a matter of routine optimization within the teachings of Yamada et al to determine a suitable distance between the upper surfaces of the conductive layer and the substrate, to achieve the substrate 1 and conductive layer 9a formation steps of Yamada et al to be performed.

Notwithstanding, it would have been an obvious matter of design choice bounded by well known manufacturing constraints and ascertainable by routine experimentation and optimization to choose these particular dimensions because applicant has not disclosed that the dimensions are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical, and it appears prima facie that the process would possess utility using another dimension. Indeed, it has been held that mere dimensional limitations are prima facie obvious absent a disclosure that the limitations are for a particular unobvious purpose, produce an unexpected result, or are otherwise critical. See, for example, *In re Rose*, 220 F.2d 459, 105 USPQ 237 (CCPA 1955); *In re Rinehart*, 531 F.2d 1048, 189 USPQ 143 (CCPA 1976); *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338, 220 USPQ 777 (Fed. Cir. 1984), cert. denied, 469 U.S. 830, 225 USPQ 232 (1984); *In re Dailey*, 357 F.2d 669, 149 USPQ 47 (CCPA 1966).

Claims 14 and 15 would be allowable if rewritten to overcome the objection(s) set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

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Claims 3, 4, 7-11, 22, and 23, are allowed.

Any inquiry of a general nature or relating to the status of this application should be directed to the Group Receptionist whose telephone number is (703) 308-0956 until 2/4/04. See MPEP 203.08.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to examiner Joannie Adelle Garcia whose telephone number is (571) 272-1861. The examiner can normally be reached on Monday through Friday.

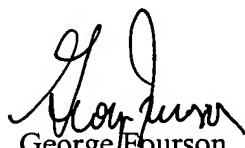
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri, can be reached on (571) 272-1855. The fax number for this group is 703-872-9306 for before final submissions, 703-872-9306 for after final submissions and the customer service number for group 2800 is (703) 872-9317. Updates can be found at <http://www.uspto.gov/web/info/2800.htm>.



JAG

September 14, 2004

George Fourson  
Primary Examiner



George Fourson  
Primary Examiner  
Art Unit 2823